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Submission date:	February 2016
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Problem description:

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

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Abstract

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Sammendrag

Sikkerheten til nesten all offentlig nøkkel-kryptografi er basert på et vanskelig beregnbarhetsproblem. Mest velkjent er problemene med å faktorisere heltall i sine primtallsfaktorer, og å beregne diskrete logaritmer i endelige sykliske grupper. I de to siste tiårene, har det imidlertid dukket opp en rekke andre offentlig nøkkel-systemer, som baserer sin sikkerhet på helt andre type problemer. Et lovende forslag, er å basere sikkerheten på vanskeligheten av å løse store likningsett av flervariable polynomlikninger. En stor utfordring ved å designe slike offentlig nøkkel-systemer, er å integrere en effektiv "falluke" (trapdoor) inn i likningssettet. En ny tilnærming til dette problemet ble nylig foreslått av Gligoroski m.f., hvor de benytter konseptet om kvasigruppe-strengtransformasjoner (quasigroup string transformations). I denne masteroppgaven beskriver vi en metodikk for å identifisere sterke og svake nøkler i det nylig foreslåtte multivariable offentlig nøkkel-signatursystemet MQQ-SIG, som er basert på denne idéen.

Vi har gjennomført et stort antall eksperimenter, basert på Gröbner basis angrep, for å klassifisere de ulike parametrene som bestemmer nøklene i MQQ-SIG. Våre funn viser at det er store forskjeller i viktigheten av disse parametrene. Metodikken består i en klassifisering av de forskjellige parametrene i systemet, i tillegg til en innføring av konkrete kriterier for hvilke nøkler som bør velges. Videre, har vi identifisert et unødvendig krav i den originale spesifikasjonen, som krevde at kvasigruppene måtte oppfylle et bestemt kriterie. Ved å fjerne denne betingelsen, kan nøkkelgenererings-algoritmen potensielt øke ytelsen med en stor faktor. Basert på alt dette, foreslår vi en ny og forbedret nøkkel-genereringsalgoritme for MQQ-SIG, som vil generere sterkere nøkler og være mer effektiv enn den originale nøkkel-genereringsalgoritmen.

Preface

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like “Huardest gefburn”? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

Contents

List of Acronyms

SWIFT Structured what-if technique

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GUI graphical user interface

NUI Natural user interface

List of Figures

List of Tables

List of Algorithms

Chapter 1

Introduction

Introduction

1.1 About the Thesis

1.2 Autonomous Mobile Robotic Maintenance

1.2.1 What and Why?

1.2.2 State of the art

1.2.3 Notable Projects

1.2.4 Future Goal (The final product)

A nice description of a potential final product.

1.2.5 State of the Art in Autonomous Robots

Notable projects etc.

1.3 Implementation Overview

1.4 Thesis Structure

Chapter 2
Background Theory

2.1 Modern Robotics

2.2 ROS

2.3 Software

2.3.1 Qt

2.3.2 PCL

2.4 The Kinect Sensor

2.5 Software Tools

2.5.1 Point Cloud Library

2.5.2 ROS

2.5.3 Qt

2.5.4 Current Research and Applications

2.6 Modern Sensors in Autonomous Robots

2.6.1 Depth Cameras

Different Methods for Depth Perception

In the context of this thesis, a depth camera is considered to be a sensor which the functionality of a regular video camera

A depth camera can be described as a regular color video camera with the ability to create spatial images. In the context of this thesis, a depth camera can more precisely be described as a RGB-D camera, which is short for red, green, blue and depth camera. A regular RGB camera will project a spatial scene onto a rectangular pixel grid, where each pixel contains intensity values for red, green and blue colors. These pixel values represents the detected scene. A major problem with RGB cameras is the significant loss of information. The information loss is mostly a consequence of 3d to 2d projection and digital quantization. RGB-D cameras have the means to reduce this information loss by mapping the pixel values to spatial coordinates, turning each pixel into voxels and the image into a point cloud of voxels.

Different variations of depth cameras will usually fall into one of two categories: active or passive. Passive sensors perceive the surroundings as it is, without actively interfering with the environment as a part of the sensing process. A typical passive RGB-D sensor is the stereo camera. Stereo cameras use a stream of synchronized image pairs to perceive depth. The image pairs are displaced along the horizontal axis, and the depth information is extracted by searching for mutual information in the image pairs. How far the information is displaced from the left to the right image is directly related to how far away from the camera the information source is located.

Active sensors depend on some form of projection onto the surroundings. For depth cameras, the projection is usually in the form of laser or infra red light. In RGB-D cameras it is essential that the projected light is distinguishable from the visible spectrum. The Kinect sensor used in this project is an example of an active RGB-D sensor.

Natural User Interfaces

When a group of designers are developing a new graphical user interface (GUI), they will often use a conceptual model when planning their design. The conceptual model is the mental model the designers want to put into the head of the user. All users will develop their own individual mental model, which is their high level understanding of how the GUI works. A conceptual model may contain metaphors for things the user already is familiar with. A painting program for example may use a metaphor for a canvas, paint brushes and palettes. When the mouse icon changes to a paint brush, most users will have an intuitive understanding of what it can do and how it is used. A Natural user interface (NUI) will seek to remove the metaphors and create a more seamless interaction between the user and the machine. Some NUIs may allow a user to write text with a pen instead of a keyboard, or dictate a letter with their voice while the computer puts the words into text.

The Microsoft Kinect sensor was initially designed as a NUI for the XBOX 360 gaming console. The sensor allows users to use gestures and sounds to play console games. Later on, Microsoft has released SDKs for Windows, enabling developers to create NUI applications for PC.

The modern RGB-D sensors which are commonly used in robot research projects today were initially intended as NUI.

2.6.2 LIDAR

Chapter 3
Implementation

3.1 Implementation 1

3.2 Implementatpon 2

Chapter 4

Testing

4.1 Testplan

4.2 Test Plan

4.3 Results

Chapter 5
Discussion

Chapter 6

Conclusion

6.1 Future Work

6.2 Task Fulfillment

6.3 Task Fulfilment

6.4 Final Conclusion

References